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ABSTRACT

Twenty-one criteria for assessing communication effectiveness in organizations provide the basis for discussion in this document. Grouped under the general heading of communication rules, the criteria are described according to five categories: structure, messages, media, communicator, and potpourri (factors that affect the decision making of communicators but are not directly related to communication). The major research literature regarding each criterion is identified by author and discussed in terms of effective and ineffective communication, in an attempt to define "communication effectiveness" in operational and practical terms. The paper concludes with a suggested outline of the steps involved in developing this initial effort--the derivation of propositions or assertions, operationalization and measurement, and research that will provide empirical evidence about the reliability, validity, and value of the criteria. An extensive bibliography is appended. (Author/MAI)

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Review and Synthesis: Criteria for the Evaluation of Organizational Communication Effectiveness

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Scholars of organizational communication have long had to grapple with the problem of explicating, measuring and applying the concept of "communication effectiveness." Since the concept has, by its treatment and its typical conceptualization, been very broad in nature, little progress seems to have been made in making it useful in either a scholarly or pragmatic sense--even though the need to do so is widely felt. The present paper is an initial explication of some of the elements of organizational communication effectiveness as described and summarized on the basis of a comprehensive literature review. Subsequent papers will deal with the development of propositions concerning the criteria, measurement techniques, and potential research investigations. Initially, some comments will be made about the authors' conceptualization of communication.

Some communication scientists define the principal function of communication as the reduction of uncertainty (Farace, Monge and Russell, 1977). Many scholars argue that this is the sole motivation for communication. The reduction of uncertainty is directed toward the specific goals of the message source, so as to achieve as much control over the receiver during the process of uncertainty reduction as possible. Thus, uncertainty reduction through communication--whether this is labelled "education", "information", "public relations", "specification", "explanations", etc.--is fundamentally designed to limit the range of alternatives a receiver may engage in after receipt of the message. This means that communication is directed at, in some fashion, controlling the behavior of the receiver.

Similarly, the function of the process of organization is the reduction of variability in human behavior. Organizations render the collective behavior

and the outcomes of many individuals predictable. This occurs through communication--and hence, there can be no separation between "organizing" functions and communicating functions in organizations (Weick, 1969).

Communication scholars argue that three categeries of change through communication are (1) knowledge, (2) attitudes, and (3) behavior. In general, knowledge is designed to re-direct the focus of a receiver's available choices. Attitude change communication is designed to increase the tendency that a receiver will act in a particular way at subsequent points in time. Communication aimed at behavioral change, the most difficult of the three to achieve, is designed to produce immediate compliance or to instill a long-term behavioral pattern in a receiver. It should be obvious that most communication events contain elements of all three of these factors, particularly communication in organizations.

Communication increases the probability that the receiver will come into greater compliance with the source, and hence, communication acts to render the world more predictable. This same comment can be applied to the processes involved in the formation of organizations. Organizations allow predictions to be made about the conversion of the resources into some product. Organizations exist because it is easier for a large group of people, acting interdependently, to transform resources than the same set of individuals could accomplish if their entire efforts were spent working alone. Organizational processes focus centrally on the control and coordination of people and resources. The mechanism through which control and coordination is accomplished is communication.

The objective of this review is to present in outline form some major concepts used in viewing communication and organizations. Our interest is

in establishing criteria by which the effectiveness of communication in organizations may be judged and evaluated. At a macro-level, the criteria are: (1) does the communication event increase the ability of the organization's managers to control production processes, and (2) does the communication event enhance the ability to coordinate these same processes. These two categories are, in themselves, too broad to be useful, and they give organizations a stigma of possessing a lack of sensitivity to the human needs of its members. Scholars have long noted that managers are responsible for the adjudication of the balance between organizational productivity norms and the needs of the individual members of the organization (Simon, 1957). Thus, an extensive list of criteria which incorporates both the control and coordination notion, and the human dimension of organizational functioning, is proposed.

Communication effectiveness can be defined in general as:

> the degree to which the response to a message transmission event is consonant with the overall objectives of the initiator of the event.

Thus, from an individual's point of view, communication is effective when the receiver complies with the intent of the source's message. From a managerial viewpoint, communication is effective when subordinates as a group respond behaviorally in congruence with the manager's message; in such a case, the manager is thus able to accurately predict the outcome of the message that he or she disseminates, and can encourage that outcome through the message itself, the choice of medium, and the code system employed.

Further analysis of this definition reveals that communication is effective when: (a) the objectives of the sender, with respect to particular messages, will have a high probability of being fulfilled, and (b) the uncertainty of fulfillment is due to failures other than the communication

process itself. While one can concur that communication is effective when there is a high probability of understanding, or responsive behavior, exception should be taken to the implicit notion that effectiveness is dichotomous. Communication effectiveness is not "caused" in the classical sense of Event A being a necessary and sufficient antecedent of Event B. Rather it "emerges" when the sum of scores for an organization on a set of factors produces a value within a specified range. Communication can be ineffective, and it can be too effective. When it is ineffective an organization suffers from excessive error. When it is too effective, the organization suffers from various dysfunctions (e.g., boredom, apathy) resulting from an excessive concentration of resources on communication acts.

In summary, communication is effective when the outcome of a message event can be accurately predicted. To the extent prediction is incorrect, then the communication involved is ineffective.

This definition of communication effectiveness should be contrasted with a definition of communication efficiency. While the goal of predictability in communication events is generally a worthy one, that goal must always be conditioned by the cost of achieving it. Communication efficiency is the outcome of the relationship between the amount of resources expended in transmitting information or messages, and the utility of the transmission event. The more important the expected outcome, the greater the utility of the transmission event. Similarly, the more important the outcome, the more resources a manager should be willing to expend in achieving that outcome. Since efficiency is a conditional variable (i.e., efficiency and effectiveness are functional covariants), it is important to recognize that the degree of effectiveness an organization achieves is ultimately dependent upon the level of resources it brings to bear to achieve predictability.

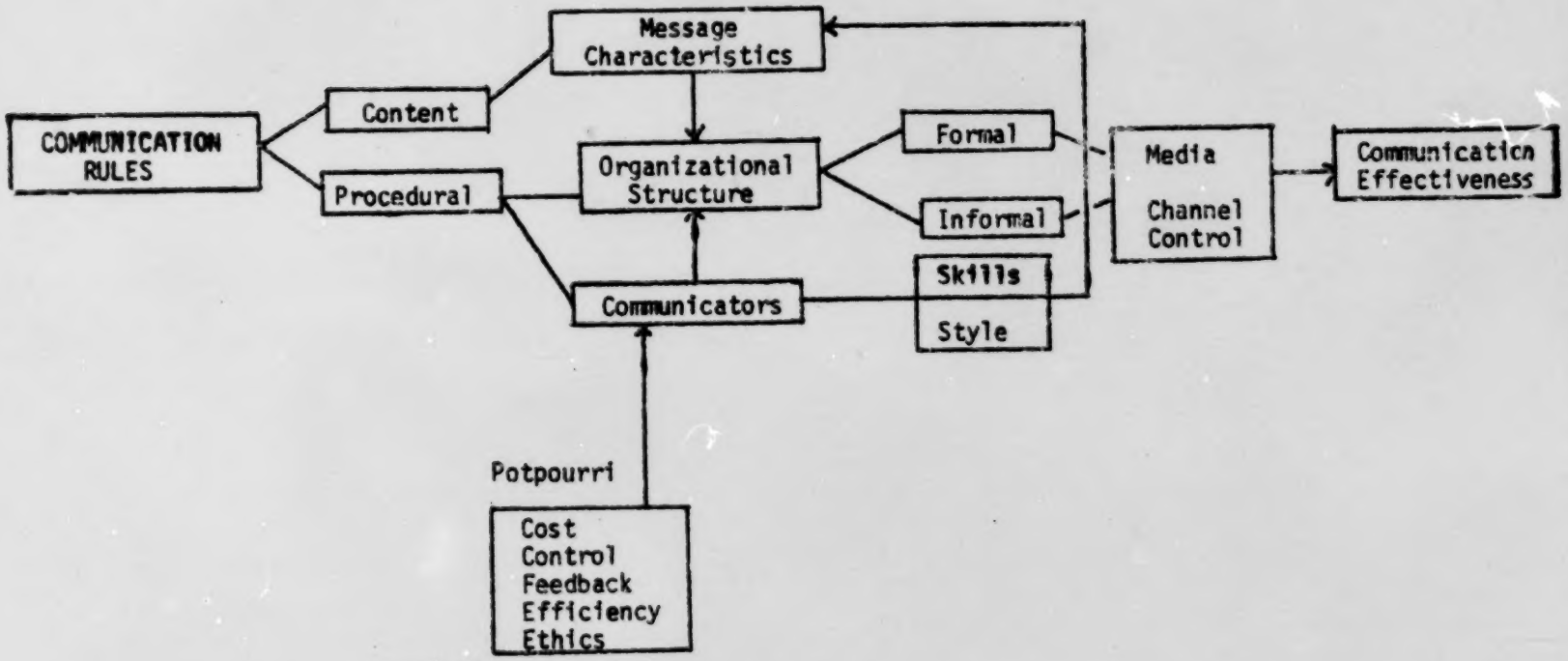
Consequently, the concept of effectiveness is clearly a macro-level entity; one composed of numerous elements. Each of these elements, in itself and in conjunction with others, contributes to the organization's overall level of effectiveness. However, it should also be kept in mind that the resource constraints involved in the concept of efficiency will always act to limit the total aggregate effectiveness which an organization can achieve. Therefore, the critical decision topic for managers is the selection of those effectiveness criteria which need to be maximized in order to achieve the greatest overall efficiency of communication in the organization.

Five primary dimensions of communication effectiveness are proposed, all of which are subordinate to the nature of the communication rules which govern and control the flow of messages throughout the organization. The five primary dimensions are: (1) the structure or patterning of message movement; (2) the messages that move through the structure, (3) the communicators that send and receive the messages; (4) media characteristics, and (5) a potpourri of additional effectiveness criteria. These relationships are diagramed in Figure 1. For purposes of brevity, media characteristics are not considered here.

> Communication rules refer to the norms or rules which govern and control the content and protocol associated with the transmission of information in an organization. This is a macro-category which affects all others, since each category is governed by its own unique set of rules.
>
> Message characteristics refer to content, format, and style of messages.
>
> Organizational structure refers to the pattern of communication relationships and supervisor-subordinate communication relations which collectively comprise the organization. They are of two types: formal and informal.
>
> Communicators possess characteristics which affect the composition, frequency, competence and satisfaction of communication events.

FIGURE 1

DETERMINANTS OF COMMUNICATION EFFECTIVENESS



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Media characteristics refer to the channels, channel properties, and channel choices which can be made in the distribution of information.

Potpourri refers to factors which affect the decision-making of communicators about communication, but which do not primarily fit in to one of the above categories. These refer to such factors as cost, control, feedforward, efficiency and ethics.

Communication Rules

Within all organizations, a set of formal and informal rules exists which governs the conditions under which information exchange takes place. A formal rule is one that is codified in some permanent fashion and disseminated to those individuals whom it affects. Generally, specific organizational sanctions exist for violation of a formal rule, Formal rules govern access to superordinates, the choice of documents to be used for types of communication, etc.

Informal rules, in contrast, are similar to norms, they are non-codified behavioral expectations which evolve over time as non-specified, generally accepted forms of behavior which are mutually shared expectations about the individuals occupying various roles in the organization. They enable individuals to have guidelines for behavior regarding topics not covered by formal rules. They also enable individuals to learn when and under what conditions it is appropriate to bypass formal rules. Sanctions for violating informal rules also exist, and they can be as severe as sanctions for violating formal rules. Sanctions include criticism, ostracism, and ridicule. In addition, consistent violation of informal rules can seriously hamper upward organizational mobility. The majority of communication events in an organization will tend to be governed by informal communication rules (Downs, 1967). Informal communication rules are likely to be relatively uniform within hierarchical levels within the organization.

Another important distinction which can be applied to communication rules is the difference between content and procedural rules (Cushman and Whiting, 1972). Content rules govern the standard usage or consensus among communicators on how to describe a concept or issue, the attributes of concepts or issues, and the functions of the concepts or issues for the organizations. Content rules describe the conditions under which given topics may be addressed, the appropriate terminology to use in discussing them, and the types of "meaning" invoked by a communication. Conventional language allows a communicator considerable flexibility in the application of these rules. However, effective management of communication requires, at a minimum, a baseline level of agreement among the members of the organization as to how these content rules are to be observed. Note that this issue of agreement pertains to both formal and informal rules.

Procedural rules, in contrast, guide choices individuals make about method of transmission of messages, appropriate sources, routing protocol, and the myriad of other scheduling events involved in bringing about and concluding communication events. Procedural rules specify relevant media, timing of information flow, distribution policies, the conditions under which and the persons to whom information may be addressed, and other aspects of the circulation of information in the organization. Procedural rules specify who is to be included in various distribution lists, the specific format of the document, and individuals who must review a document prior to dissemination. Consequently, procedural rules have the capability of exercising as much, if not more, influence on the character and nature of communication as do content rules. Again, effective management of communication requires, at a minimum, a baseline agreement among the members of the organization as to how these

procedural rules are to be observed. Given this brief review of the concept of communication rules in organizational settings, we will next describe the procedures by which the potential effectiveness criteria were developed for each of the four areas grouped under the "rules" heading.

Search Procedures for the Identification of Criteria

The authors used two basic strategies in obtaining the literature used for this report. They drew upon their own materials from the fields of organizational and management theory, communication theory, and related fields. Second, access was obtained to broad-based sources of potential literature with which the authors might not be familiar. The initial literature set was augmented by a computer search of the following automated data bases: (1) Social Science Search; (2) Sociological Abstracts; (3) Psychological Abstracts; (4) Inform--a collection of materials devoted to organizational processes; (5) Educational Resources Information Center (ERIC); (6) National Technical Information Service (NTIS): and (7) Dissertation Abstracts. Summed, these data bases contain more than two million separate citations of articles, books, bibliographies, monographs, and other materials.

To search these data bases, the following procedures were used. First, a set of key terms related to communication (with emphasis on print messages) was identified on the basis of a preliminary review of recent literature on organizational communication. The search procedure requires that at least one of the key terms appear in the title of the cited item. Separately, a list of 49 key words, each reflecting a possible criterion or sub-criterion element, was linked to the initial set of terms. The set of 49 terms was allowed to range freely, i.e., to appear anywhere in the citation--title,

abstract, index term, etc. This procedure was implemented on each data base and yielded a total of 3,555 separate citations. The search terms are shown in Table 1.

Next, the citations and their abstracts (if present) were screened by the authors for relevance. All citations considered germane by one or more persons were then sought out for photocopying and retrieval. An attempt was made to locate the materials in three sites: (1) State of Michigan Library, Lansing; (2) the Michigan State University Library, East Lansing; and (3) the University of Michigan Library, Ann Arbor. Further screening of the relevance of citations took place as each item was located. The result of this activity produced a new sub-list and a library of some 450 items.

In the sections that follow, four categories of communication effectiveness will be presented. Within each dimension, specific communication effectiveness criteria will be described, and relevant literature will be cited and discussed. The first of these dimensions is "communication structure."

A. Communication Structure

Organizations are composed of two principle kinds of relationships. The first relations exist because of the provisions for hierarchical authority found in organizations. Hierarchical relations are typically described as a pyramid, where control is manifested at the top, and different levels within the pyramid indicate different amounts of power and authority. Hierarchical relations can also be identified as a network; the network indicates the direction of flow. Depending on the context of a communication event, organization members are more or less likely to use this formal, hierarchical network.

In conjunction with a formal network, a network of informal or subformal relationships coexists in organizations (Etzioni, 1966). Informal networks

TABLE 1

Search Terms for Communication Effectiveness Criteria

Title Terms	Criterion Terms		
communication	clarity	rate	guidelines
information	accuracy	flow	procedures
messages	timeliness	movement	regulations
text	believability	value	policy(ies)
print	utility	content rules	efficiency
technology transfer	completeness	procedural rules	persuasiveness
documents	complexity	appeal(s)	acceptance
	conciseness	organization	goals
	readability	competence	change
	attractiveness	regulation	aims
	comprehensiveness	specification	objectives
	comprehension	networks	results
	understanding	consensus	outcomes
	agreement	relevance	effectiveness
	volume	dissemination	impact
	intensity	distribution	effects
		format	

are central to the overall functioning of the organization. They can be conceptualized as patterns of communication links governed by the organization's informal rules. Downs (1967) argues that most communication in an organization travels along a subformal or informal network. Such networks, regardless of whether they operate on a face-to-face, print or other media basis, are composed of two main elements: nodes and links. A node in such a network can be an individual, an organizational sub-unit, or the organization itself. Links are demonstrated by the flow of information between nodes. This flow may proceed in varying directions and degrees; that is, formal procedures may specify that one unit must initiate contact with another before moving ahead on a project. This has important implications for the way information may be handled, and the way that decisions based on that information can be made. For example, in an analysis of a network problem, we may find that the directionality of flow between two key nodes is contrary to the needs and desires of the two nodes. Such a situation might constitute a serious impediment or threat to effective communication. Thus, by comparing the "actual" network with the "desired" network, it becomes possible to develop specific strategies to organize the system's communication capabilities more adequately. The following criteria are relevant to the concept of communication structure.

1. Accessibility

Accessibility can be defined as the degree to which any node in the network can be reached in one-step (or more) communication from all other possible nodes in the network. Accessibility is independent of hierarchical position. Downs (1967, p. 125) notes that in organizations in which all individuals are accessible to one another, without reference to normal supervisor-subordinate relationships, middle level managers are likely to be discontented.

In those organizations in which a high rate of "bypassing" is encouraged by higher management, there will usually be an informal norm which mitigates against the practice. Downs discusses several reasons for encouraging high accessibility. These include the ability (a) to eliminate or reduce distortion, (b) to validate information before placing it into formal communication channels, (c) to circumvent certain subordinates who refuse to communicate certain ideas upward, (d) to increase the speed of information flow, particularly information that arises in stressful situations, and (e) involve subordinates more fully in the process of decision-making.

Rothwell and Robertson (1975) state that organizations often do not develop specific policies that promote the effective flow of information. One systematic technique for encouraging reasonable accessibility is the formation of an "information department," which in effect reroutes intelligence around hierarchical levels in the organization. However, these departments are frequently among the first to suffer the consequences of an economic downturn; they are eliminated in times of economic stringency. This tendency contradicts the purpose of such a department, since it is in precisely such times that it should be of greatest value. In addition, the authors indicate that with knowledge of communication processes, an information department can generate and facilitate innovation in the organization.

Schneider (1971) urges that communication accessibility be made important when an organization has highly complex and variable tasks. Specifically, he recommends that organizations develop a system for routinely distributing information to those individuals with unique competencies. To support his view, he cites research suggesting that 30% of scientific manpower is wasted because

needed information is not available to the correct person at the correct time. In our view, this is an accessibility (as well as a timeliness) problem.

Chakrabarti (1972) emphasizes the importance of communication channel access. If channels of communication are not well understood, communication will be less effective. He also indicates that communication will be more effective when: (1) channels exist linking every member; (2) the lines of such channels are kept as short as possible; (3) complete lines are employed; (4) the individual nodes have sufficient communication competence, (5) the lines of communication cannot be easily broken, and (6) procedures exist to authenticate communication acts.

One important aspect of accessibility (as well as of a number of other criteria presented in this paper), is the degree to which perceptual processes determine how organizational members respond to the specific criterion. In the case of accessibility, it is important to examine whether system members perceive that other key actors, with whom they may or may not be in direct contact, are accessible. While the formal hierarchy may prescribe a routing plan for the movement of information, individuals may not perceive that they can in fact use that pathway. In addition, organizational members may not know where the best targets for the information are (i.e., the roles of others are not clearly defined). They may not know how to develop an appropriate "game plan" to transmit the information. Problems of accessbility often cause people to not have the information they need to perform their work properly.

2. Flow Control

Flow control refers to the ability of managers to regulate the dissemination of a message. High flow control exists when a manager can make clear-cut decisions about whether, and in what form or timing, a message will

pass through his or her office--to either higher levels or lower levels in the organization (Rothwell, 1975).

Implicit in the concept of flow control is the possibility that a manager may not specifically know the intended recipient for a given communication. Communication becomes effective to the degree that the manager knows the appropriate "gatekeepers," "opinion leaders," or "key communicators" who serve as information managers. By virtue of their position in the communication structure, key "information manager" (whether formal or not) can initiate message routing sequences (Oniki, 1974). Effective communication thus presumes a wide knowledge of which organizational members comprise this key group, and how they themselves may be accessed. In time of conflict, flow control becomes critical because competing organizational sub-units will only communicate formally (Downs, 1967). In popular terms, "information (flow control) is power."

O'Reilly and Roberts (1974) provide evidence that considerable distortion of information occurs as it travels through an organization. This problem is more severe when a large proportion of the information flow is up the organizational hierarchy. Communication will be more effective when communicators know the shortest feasible paths for transmitting information (Clarey, 1966). Communication will also be more effective when the information sent up the hierarchy (or received from lower levels) passes through the fewest possible intermediate steps. The problem of upward communication in particular is that intentional distortion through flow control is likely to aggravate other more naturally occurring distortion processes involved in transmission of information.

Allen and Cohen (1969) and Downs (1967) supplement the comments above by reporting that more information is transmitted within status levels than across

levels. Furthermore, lower status individuals attempt to send information upward more often than high status individuals initiate downward flow. Therefore, high status individuals contribute to blockage which restricts upward flows of information to them; unfavorable but important information is often denied the higher level decision-makers, who are nevertheless dependent on traditional hierarchical communication flows. Allen and Cohen (1969) further indicate that low status individuals tend to have large numbers of contacts with individuals outside the organization, since they are less likely to have been in the organization as long as high status members. This further indicates the restriction on information incurred by high status individuals as a consequence of flow control decisions made at lower levels.

One consequence of limited upward communication is due to the failure of managers to act on undersireable conditions that have previously been brought to their attention. This often results in a loss of faith by subordinates, both in the sincerity of management, and, more importantly, in the value of communicating with management in general (Planty and Machaver, 1952).

Flow control is an equally important problem, if not more so, for downward communication, where the opportunity for information restriction, modification, enhancement, etc. is very common. A companion loss in communication effectiveness is also a byproduct of downward flow control.

3. Hierarchiality

As modern organizations incorporate wider spans of supervision, the "pyramid of control" has become substantially wider at the base, and shorter in height. Hierarchiality refers to communication which occurs between levels of authority, or across a specific level of authority. It is complicated

by the differences between staff and line functions, and, within levels, the differences between competitive and cooperative sub-units of equal hierarchical authority (Carzo and Yanouzas, 1967).

Further analysis reveals that as organizations seek to reduce hierarchical conflict by decreasing the number of supervisory levels (and thus increase the ratio of subordinates to supervisors), communicative complexity is radically increased. Also, as subordinates are added to a supervisor's work group, the amount of time that the supervisor can spend with the individual is proportionally decreased. Consequently, decreases in the amount of hierarchiality in an organization's structure have a marked impact on the amount of time a supervisor can spend communicating with subordinates, and this in turn affects the probability that high agreement and accuracy will be able to exist in supervisor-subordinate relationships. Changes in hierarchiality will therefore have a definite impact on the level of communication effectiveness. The trade-off here appears to be the communication problems involved in requiring information to pass through a number of hierarchical levels versus the individual problems associated with many subordinates reporting to fewer supervisory levels.

A similar problem exists between staff and line distinctions in organizations. Etzioni (1966) points out that higher and lower ranking line personnel often form coalitions against staff personnel, which obfuscate existing hierarchical distinctions, and hence, the very function the hierarchy is intended to perform. To the extent this problem exists, it mitigates against effective communication.

4. Network Role Distribution

In addition to hierarchical positions, which are more formal assignments of communication role, individuals may be classified into informal

communication roles (Monge and Lindsey, 1973). An organization can be analyzed, and communication problems diagnosed, by examining the pattern of distribution in the informal communication roles. The roles are: (1) communication members of cliques (Festinger, Schachter and Back, 1950; Porter and Lawler, 1965); (2) bridges, individuals who are themselves members of groups, and who link other groups, and thus provide an avenue for information to flow between large bodies of people, (3) liaisons, individuals who link groups, but who are not themselves members of groups. These individuals perform key gatekeeping roles (Guetzkow, 1965, Farace and Danowski, 1973; and Taylor, 1977) and as a result influence the behavior of the system far in excess of their formal role assignment; and (4) isolates, persons who have minimal or no contacts with other members of the organization (Richards, 1974) and who are usually poorly informed, poorly integrated and least participative. If there are a large number of group members, there will be a higher level of tolerated organizational conflict, and more organized formal and informal politicking (Taylor, 1976). If there are relatively few bridges and liaisons in the organizations, the organization will be highly differentiated, and information flow will be seriously impeded (Farace and Danowski, 1973), particularly when the organization lacks liaisons between sub-units (Wigand, 1975). In any organization, it is imperative that management make a careful assessment of the placement of bridges and liaisons to ensure that appropriate linkages between sub-units are in fact in place and operating.

If more than a small percentage (perhaps 5-10%) of the members of an organization are only minimally connected to the other members--i.e., are classed as isolates--and if the organization's members perform complex tasks requiring considerable interdependence, there will be a considerable problem in overall communication effectiveness.

An issue related closely to the precise distribution of organizational members into communication roles--and one which dramatically affects the performance of a communication network--is the degree to which members of the network are transient. While little or no research has touched upon the issue, it seems clear that transferring personnel may create havoc with networks, particularly if the individual occupies a key communicative role in the informal network. Taylor and Farace (1976) indicate that "key communicators" can be used effectively to disseminate important information to the larger network of which they are a part. Conversely, if these same key communicators are not given adequate information about a particular topic, they can act to block attempts to introduce information made through other means. One of the consequences of routine transfer of personnel, for example, is that they are less likely to emerge as important members of an informal network. This suggests that whenever transients are a "fact of life" in an organization, its communication will be less effective; in addition, more emphasis must necessarily be placed on the formalization of communication roles to ensure that the movement of information throughout the organization occurs as needed.

5. Integrativeness

Integrativeness refers to the degree an individual is linked within a communication network to others who are also linked together. Thus, the criterion of integrativeness is related to the degree to which an organization and its sub-units are composed of dense linkage patterns (Jacobson and Seashore, 1951). Danowski (1974) indicates that integrativeness is a good predictor of the overall level of redundancy of information in a communication network. Highly integrated individuals are likely to encounter the same information more than once (through more than one network pathway), and hence

have more opportunity to comprehend or verify it. Therefore, organizations composed of highly integrated individuals have higher levels of redundancy and lower levels of distortion and error, and hence have more effective communication.

6. Connectedness

Connectedness is ordinarily a measure of the interaction density of organizational subgroups. It differs from integrativeness in that it is an aggregate variable which describes varying density values for organizational sub-units formed according to certain criteria, such as work groups, friendship, kinship, etc. Taylor (1976) reports that groups higher in connectedness show lower variance in member attitudes. Danowski (1974) found that connectedness was a good predictor of the level of homogeneity (or similarity) with respect to key norms and goals within a network. Mitchell (1969) argues that connectedness can be taken to be critical to the development of morale and satisfaction, inasmuch as it is related to the development of affective rewards in the work place.

7. Overload and Underload

Overload may in general be defined as the inability of a member of an organization to adequately process information received. Quite simply, it occurs when a person receives more information per time period than he/she can cope with (Hofford, Gerloff and Cummins, 1977). A second condition under which overload often occurs is when large quantities of information are systematically routed through the same point in a network. Miller (1964) notes that there are seven typical responses to communication overload: (1) omission--failure to adequately process information; (2) incorrectly processing all information; (3) queueing--arbitrary sequencing information with no regard to

importance, (4) filtering--separating out according to some category scheme using some set of rules, usually idiosyncratics (5) approximation--categorizing information and using blanket responses; (6) employing multiple channels--altering flow by manipulating channels and directing information away, and (7) escaping--avoiding information. It should be clear that certain of these techniques are more rational for the individual in some circumstances than others.

Any organization experiencing wide-spread overload among its members is quite probably exhibiting a very high level of error. Gross and Springer (1967) argue that overload creates an organizational "intelligence gap" by causing the accumulation of large quantities of unused information. Since the techniques members may use to reduce overload are often random in the aggregate, policy makers will be misled and lack critical information for decision making. A related problem first touched upon Emery and Trist (1965) occurs when the rate of change for an organization constantly induces increased information processing demands at the same time that environmental pressure causes considerable internal turbulence and the perception of crisis. Over time, expanding demands create increased irrational responses, causing increased uncertainty and expanded perception of crisis, eventually leading to significant organizational breakdown.

Huber, O'Connell and Cummings (1975) note that high information overload increases perceived organizational uncertainty. As a result, organizational structure may vary substantially with perceived environmental uncertainty. Thus, in part, the structure of an organization is influenced by those positions within its network at which overload occurs. By learning where overload is a constant factor, organizational managers can predict structural

change, and, hence, plan those changes. Another possible phenomenon which is associated with variable distribution of information load (some people overloaded, some people not) is the misperception of slack resources, and the consequent misallocation of resources (Galbraith, 1974; Summers, 1974).

Underload has been defined as the absence of sufficient information to achieve peak productivity. It is the obverse of overload. Implicitly underload means that an individual is not receiving enough information to keep busy. Danowski (1975), Farace, Monge and Russell (1977), and Johnson (1977) argue that underload causes extreme dissatisfaction with the work environment. Some of the typical consequences of underload are employee boredom, the tendency of personnel to fabricate time-consuming activities that are usually of a non-constructive nature, the use of free time in which grievances lead to dissatisfaction, and finally, an increase in accident rates resulting from carelessness or neglect of duty.

8. Purposive Information Acquisition

One technique organizations develop to cope with uncertainty is to "routinize" common topics of uncertainty. This means that organizations identify those areas in their operations about which they are consistently uncertain. To resolve the uncertainty, they store information, and develop techniques for scanning the relevant environment so that when the uncertain topic re-emerges, the necessary information is available.

Among the devices now in use by organizations are the computer based information systems. Lucas (1975) reports that unfortunately there is little research at the present time which adequately evaluates the impact of information systems or suggest ways to better utilize these systems. Evaluations of information systems should consider the relationship between the use of the

system and performance. In any kind of a management system, there are various classifications of decision-making with which the manager is confronted. These decisions can range from extremely perfunctory kinds of decisions to highly complex ones. Typically, decisions can be classified into three general categories: (1) strategical, (2) tactical, and (3) technical. The key interest in using an information system is to produce timely information that is pertinent and applicable to any of these three categories. The specific needs of the organization will determine what type of information system must be gathered and restructured to meet the decision-making needs of the organization on a productive and efficient basis.

Burch and Strater (1973) found that formal information systems are severely limited as to how much relevant information they can provide any given level of decision-making. Therefore, information systems are substantially more effective and serve better tactical and technical decision-making even though there is still a great potential for analysts to serve the strategical level. Informational needs at all levels can be met more effectively if the individual analyst and the information system work together in tailoring the information output to fit the users' needs.

Turpin (1972) found that a company can reduce 10-20% of its paper work by taking a critical look at internal information control procedures. Hidden in these procedures are any of several check and cross-check requirements, which if found to be extremely time-consuming and costly, can be discontinued without great risk to the overall efficiency of the organization. (In fact, this particular study emphasizes the fact that general efficiency in the use of an information system greatly enhances general communication efficiency.) As noted earlier in this paper, efficiency and effectiveness are highly interdependent concepts (c.f., Allen and Cohen, 1969).

Kneitel (1975) points out that one of the primary goals of communication is to ensure that data are transmitted within a given network without loss. Fulfilling this goal is a major criterion for incorporating an information system into the everyday workings of an organization, thus realizing to a greater degree communication effectiveness. Ways of viewing this criterion might include the degree to which storage and retrieval methods are systematic, are understood, the accessibility of data, and human factors problems. (See: Gallagher, 1974; Bentley, 1974; Kneitel, 1975; Murdick and Ross, 1972; Ensign, 1974; Turpin, 1972; Schneyman, 1976; Miller, 1977; David and Pruett, 1975; Burch and Strater, 1973; Floyd and Zmud, 1976; Lucas, 1975; and Adelberg, 1975).

9. Uncertainty

Uncertainty is perhaps the central concept in organizational communication research. Previously, it was noted that a major purpose of communication is to bring about the reduction of variability in response, i.e., to achieve control. This implies that communication serves to reduce the number of alternatives in a situation, and/or cause the probability that a certain one of the alternatives will be selected (i.e., have a probability of choice of 1.0). These two factors--namely, the number of alternatives in a situation, and their probabilities--are the core elements in the standard definition of uncertainty. Shannon and Weaver (1949) defined uncertainty on the basis of the logarithmnic value of the divisiion of two probabilities. The dividend is the *a postiori* probability that the message received is the message actually transmitted. The divisor is the *a priori* probability that a particular message is transmitted. Many scholars have focused on these two relationships.

Lawrence and Lorsch (1967) indicate that organizational structure is a function of environmental uncertainty. For them, an organization's environment

is more uncertain if the information describing the environment is unclear, if causal relationships have not been defined, and if the time span between production of messages and feedback is relatively slow. A strong correlation was found between a general measure of environmental uncertainty and an organization's willingness to expend resources on more efficient means of information transfer. Similarly, Galbraith (1974) found that the greater the net task uncertainty, the greater the amount of information that must be processed among decision makers during task execution to achieve a given level of performance. Huber, O'Connell and Cummings (1975) argue that perceived environmental uncertainty is a critical intervening variable in the linkage connecting organizational environment with organizational process, structure, and performance. When administrators perceive their organizational environment to be uncertain, they will expand the organization's information processing capacity, and hence, its task performance. Continuing, Huber, et al., argue that environmental uncertainty is a function of (a) information load, (b) organizational structure, (c) the background of organizational respondents, (d) the duration of participation in organizational tasks, and (e) the stability of the perceived environment. They argue that administrators can control and manipulate, to a degree, organizational structure and information load to minimize perceived environmental uncertainty. Therefore, when managers perceive environmental uncertainty, and act upon it informationally, net organizational communication effectiveness will be enhanced.

Duncan (1972) clearly supports management's responsibility for the reduction of environmental uncertainty. He states that the organization's internal environment is a function of its perceived external uncertainty. He conceptualizes environmental uncertainty as: (a) lack of information about

relevant factors that impact a decision, (b) lack of knowledge about organizational decisions, and (c) lack of ability to assign probabilities to the distribution of environmental impacts upon the success of an organizational decision. Duncan's views are quite similar to what March and Simon (1958) term "uncertainty absorption":

> Uncertainty absorption takes place when inferences are drawn from a body of evidence, and the inferences, instead of the evidence itself, are then communicated. ...in all of these cases, the person who summarizes and assesses his own direct perceptions and transmits them to the rest of the organization becomes an important source of information premises for organizational action. The 'facts' he communicates can be disbelieved, but they can only rarely be checked. Hence, by the very nature and limits of the communication system, a great deal of discretion and influence is exercised by those persons who are in direct contact with some part of the 'reality' that is of concern to the organization. Both the amount and the locus of uncertainty absorption affect the influence structure of the organization.

Thus, it should be clear that positions of informational leadership, e.g., liaisons and bridges, intervene powerfully, and, in concert with technological gatekeepers (c.f. Allen and Cohen, 1969) radically affect an organization's perception of its own level of uncertainty. To the degree that general levels of organizational uncertainty can be measured, and to the extent that key communicators' levels of uncertainty can be measured, powerful predictors of both organizational priorities (particularly informational priorities) and organizational information processing performance can be generated (Holland, et al., 1976). As these authors crucially point out, the greater the overall organizational uncertainty about needed information, regardless of information concerning task processes, the greater the amount of organizational tension and stress.

It is important to note that a continuing theme underlying this discussion of uncertainty is that some optimal level of uncertainty provides for the most

efficient level of processing for an organization. The point that low levels of uncertainty have the capability of being as dysfunctional as extremely high levels has already been noted. Therefore, uncertainty in an organization should be considered in terms of some optimal level, based upon the preferred tolerance for uncertainty (Danowski, 1975, Barnard, 1938) existing among individual members.

The point concerning optimal levels of uncertainty can also be applied to specific units within an organization. Alpert and Anderson (1973) state that while it is fundamental to human communication research that source-receiver similarity promotes communication effectiveness, it is the case that near-complete similarity produces lack of sustained interest in interpersonal relationships. Thus, particularly in organizations, it is important to optimize the dissimilarity, or the uncertainty, between members of work groups--between pairs of members, their relationships, and the data which they process.

B. Message Criteria

1. Absolute vs. Distributed Information

Messages, and the information they contain, may be more or less distributed throughout an organization. Absolute information refers to the total quantity or amount of information possessed by all the members of an organization (or in its "memory" units). Distributed information refers to the degree of dispersal or homogeneity of knowledge of a given piece of information by the members of the organization. The distinction affects communication effectiveness in at least two ways: (a) it influences the degree to which critical organizational data circulates throughout its networks, and (b) it influences the degree to which individuals with access to organizational data are evaluated.

Organizations which have a high degree of information distribution are perceived as "open" (Bennis, 1969). Schneider (1971) indicates that total distribution of information in a scientific organization (or other types as well) is impossible, due to the technicality of most scientific specialties. Thus, the concept of distribution is also an optimizing one, rather than a maximizing one. Glanzer (1973) indicates that distribution capability is limited by the linguistic difficulties encountered by the attempt to disseminate cross-discipline data. It was also reported that distribution problems, particularly problems related to a difficulty in cross-discipline linguistics, have presented adequate dissemination of research knowledge.

Distribution is therefore both an organizational and a technological problem. The absolute information criterion refers to the total amount of information available somewhere in the organization, as noted above. Muller (1974) has shown that by measuring the amount of knowledge within an organization, one is more capable of predicting the degree to which an organization approaches its "optimality frontier." By this he meant that those organizations which enjoy a high degree of absolute information operate at the edge of their productive capacity. Absolute information is also a criterion of communication effectiveness because it predicts the degree to which an organization will have to expend resources to inform systems members about crucial organizational responsibilities.

2. Frequency and Volume

Frequency is defined as the rate of transmission of messages per unit time period, and volume represents the total aggregate of messages within that time period. To many communication scholars, measures of message frequency

and volume are fundamentally related to the development of cognitive processes in individuals (Newcomb, 1953; McPhee, 1972; and Saltiel and Woelfel, 1975).

In general, these authors argue that the effect of a large volume of information advocating an attitude or behavior of a particular valence and magnitude is to shift the attitude or behavior of a receiver in the advocated direction (Barnett, Serota and Taylor, 1976). By identifying important attitudinal or behavioral issues in the organizational context, and maintaining a record of the number, degree and direction of the messages being transmitted concerning these cognitive elements, relatively crude counting procedures can yield quite accurate estimates of the shifts that will take place in the organization's cognitive makeup. Nystedt and Magnusson (1972) argue that the greater the frequency of a specific message, the greater the reliability of judgment on phenomena associated with the message (i.e., the more frequently a goal is stated, the greater the reliability of the judgment that the goal will be used.)

Simon (1957) states that planning reduces the amount of information processing required by subordinate elements within a hierarchy by increasing the amount of discretion exercised at lower levels. In effect, he, like Taylor, Farace and Monge (1976), argues that frequency is only important when a message inherently lacks a psychological bridge between the symbols employed in the message and the symbols employed in the individual's cognitive definition of self.

Galbraith (1974) indicates that as the number of formal subdivisions involved in a response to a problem increases (N greater than 7-8), the amount or volume of information increases; as the amount increases, the decision-making capability of the departments taken as individual units exceeded. On this point, Katzman (1974) states that new information-processing technologies

have been adopted as a response to the perceived total volume of data connected with individual phenomena, and that the output of the increased processing capability only tends to increase the information responsibilities of individuals. Hence, while one may obtain an exponential decrease in de facto levels of information, the inidivual still receives a multiplicative increase in the level of in situ data.

The developers of management information systems have established several caveats affecting the tolerable volume of human information processes (Katzman, 1974). From a variety of sources, these are: (a) all individuals receive more information after the adoption of a new communication technology; (b) with the adoption of a new communication technology, individuals who already have high levels of information and ability will gain more than will individuals at lower initial levels; (c) human beings have a limited capacity to process and store information; (d) compared to human beings, machines now have unlimited capacity to store and process information; and, (e) new communication technologies and techniques create new information gaps before old information gaps are closed.

In the conceptualization of a message used here, it is considered as a discrete piece of data, reflecting meaning for some individual phenomenon. Data are by definition an aggregate of many symbolic stimuli. As the volume of messages increases, the individuals within organizations demand more processing technology. As the caveats above indicate, new technology carries with it its own demands. As we will discuss in a subsequent report on communication media, the imposition of new processing technology and new transceiving technology may satisfy the constraint of demand, but at the cost of human capacity.

3. Message Organization

Message organization refers to the degree to which messages, or a particular message, are consonant with the syntactic expectations of a receiver. When messages consistently deviate from established grammatical protocols, the message will be ineffective. This is a particular problem in government bureaucracies, which are compelled by regulations and specification requirements to construct elaborate, often redundant, and usually grammatically difficult descriptions of organizationally relevant phenomena. To the individual receiving such a communication, the message can become so complex as to be uninterpretable.

Most of the variables that have traditionally been examined under the heading of message organization deal with such factors as the placement of the conclusion, degree of internal redundancy, arrangement of main and supporting points, logical structures, etc. (Bettinghaus, 1973; Miller and Burgoon, 1973). Relatively little of this research has been done in organizational settings, taking into account the constraints noted above.

4. Uncertainty of the Message

Uncertainty also manifests itself at the message level. Messages are a response to a perceived uncertainty, and they vary in their ability to reduce uncertainty. As uncertainty is increased, the frequency of messages about a specific phenomenon will also increase (Huber, O'Connell and Cummings, 1975). Whittmore (1973) noted that the greater the uncertainty associated with a specific observation, the greater the level of information to be derived--and the greater the volume of message production about the observed event.

Secondly, as Korzenny (1978) notes, the lower the channel bandwidth through which a message is disseminated, the higher the uncertainty of the

receiver. In that vein, Holland, et al. (1976) argue the following points: (a) managers should maximize the richness of content form during periods of uncertainty; (b) the greater the degree of economic unease, the greater the uncertainty--no matter what the content of the message, (c) employee training should include the processing of highly uncertain messages, and (d) where formal channels are encouraged, and informal channels are discouraged, organizational members will experience higher uncertainty, no matter what the message.

5. Communication Function/Purpose

Communication function refers to the organizational purposes to which various kinds of communication are dedicated. Recognizing the differences discussed below in the potential types of communication functions enables managers to discriminate and d fferentiate communication content. Simply put, this prevents confusion. If these criteria can be optimized in an organization, that organization will both be more effective, and it will be composed of personnel who give more careful attention to the production and distribution of messages that lead to desired, intended effects.

Three general categories of communication functions that are frequently applicable to bureaucracies are production, innovation, and maintenance (Farace, Monge and Russell, 1977). Production communication refers to messages that deal with the work flow--issuing directives, receiving reports, specifying regulation and procedures, etc. Innovation communication is primarily directed towards messages from higher level managers that substantially encourage and reward lower-level subordinates for generating new ideas, suggestions, and comments for organizational improvements. Finally, maintenance communication deals with messages that seek to bolster the self-concept of the organizational

member as a worthy human being, and that address the issue of building organizational affiliation and identification in members.

Schuler and Blank (1976) argue that there are four types of communication in organizations. Unlike the list of Farace, et al., Schuler and Blank's characteristics represent dimensionalities of intent, rather than message content. They are: (1) informative, (2) regulatory, (3) status-quo, and (4) integrative. Schuler and Blank found that integrative communication, or communication aimed at increasing perceived member cohesiveness, is the most satisfying form of the four, and that it inspires high productivity. We suspect, however, that consistently high levels of integrative communication reduce its value in general--i.e., it has an optimum level beyond which further investment of communication resources is counter-productive.

March and Simon (1958) describe five types of communication in organizations: (1) communication for non-programmed activities, (2) communication to initiate and establish programs; (3) communication to provide data for the application of strategies for the execution of programs; (4) communication to evoke programs; and (5) communication to provide information on the results of activities. March and Simon suggest that there is a need to balance planning, innovation, production, and evaluation activities in the organization's overall message dissemination. Failure to consciously proceed induces information gaps which significantly affect decision-making abilities.

The issue underlying this criterion is not so much which of the category systems should be selected; instead, for the purposes of effective communication, it is imperative to select some system and to develop procedures for monitoring its use. Our research indicates that communication networks

in organizations vary quite radically depending on the content category on which they are defined. Consequently, management of communication networks becomes inextricably tied to the conscious use and measurement of selected category systems that reflect the range of important content issues in the organization. The specific set of content categories is typically chosen uniquely for a given organization.

C. Communicators

The next set of criteria deal with selected individual characteristics of organizational members. Organizations, by virtue of their particular specialty, tend to adopt personnel procedures which retain individuals with homogeneous characteristics. The processes of socializing in an organization also work to make the communication styles of individuals more similar over time. Organizations differ, however, in the amount of individual variation in communicator characteristics they will tolerate. Large organizations, and in particular bureaucracies with extensive histories, are generally willing to tolerate far less deviation in communicator characteristics. The environment of some organizations often places strenuous demands on it to accomplish greater rates of innovation. Thus, its dilemma becomes one of balancing its own flexibility and creativity with the necessary level of rigidity to function efficiently. (It should be emphasized that "rigidity" is a necessary, not a derogatory, characteristic of an organization.) Thompson (1967, p. 17) describes the problem in the following way:

> "The modern bureaucratic organization is dominated by the monocratic stereotype. The stereotype is institutionalized in a system of bossman roles. Modifications of the stereotype, therefore, come through variations in individual role-playing. The monocratic organization stresses hierarchical authority

> and communication (going through channels). It is highly oriented toward control, predictability, and reliability. Control is facilitated by defining jobs narrowly, programming activities into routines to the greatest extent possible, and fixing responsibilities by avoiding all overlapping and duplication."

Thompson points out that this concept of an organization mitigates against innovation and change. Communicator characteristics must therefore be seen as a reflection of allowed individual differences in key personal attributes which facilitate communication, given the constraint of a particular organizational environment.

1. Cognitive Style

Cognitive style refers to the stereotypical affective perceptual set of organizational members. Research has shown that cognitive style will vary both in the aggregate case (i.e., across all employees) and in the individual case, depending upon whether the organization is highly bureaucratic (Thompson, 1967), task oriented (Woodard, 1965), subject to environmental stress (Drucker, 1974), or subject to fluctuations in level of uncertainty (Lawrence and Lorsch, 1967). Miller, Galanter and Pribram (1960) point out that cognitive style is an outcome of environmental factors. Since organizational environments are systematic collectivities of stimuli, there is a tendency for similar cognitive styles to emerge within an organization. Communication is the vehicle through which cognitive style is developed and manifested. Miller and Steinberg (1975) state that the self-concept of an individual is a direct function of his/her communication behavior, i.e., individuals define themselves as human beings and as workers by observing their own communication behavior, and the behavior of others in their immediate environment. Note that this is the inverse of the classical psychological assumption that communication behavior is solely an outgrowth of unconscious motivations.

An organization which, at the management level, understands the principle noted above, and takes advantage of it in communication--particularly communication aimed at socializing new employees--will be more effective than one which does not (see also Pines and Julian, 1972).

2. Competence--Communication Skills

Communicator competence is a collection of specific skills dealing with an individual's ability to encode and decode, seek information, and otherwise engage in communication activities within the organization. These skills can be both related to the formal or the informal communication system. Competence skills relate to the employee's understanding of the communication rules of the organization, and his or her ability to work with (and around) the rules. Competent individuals know how to "cut the red tape." Berlo, Lemert and Mertz (1970) provide research that indicates that perceived communicator competence is a key dimension of communicator credibility. At an operational level, competence involves writing skills, speaking skills, listening skills, information acquisition skills, the ability to organize information, etc.

Argyris (1962) states that interpersonal competence is the best communication predictor of organizational success, as defined by the organization's balance sheet. Similarly, interpersonal competence is frequently cited as a key attribute in the rise in managerial levels of organizational members. Argyris indicates that competence and its importance as an organizational criterion are widely seen to stem from three basic values held by all formal organizations (p. 39): (1) the important human relationships are those that are related to achieving the organization's objectives; (2) effectiveness in human relationships increases as behavior is rational, logical and clearly

communicated, while effectiveness decreases as emotionality increases; and (3) human relationships are most effectively influenced through directions, coercion and control, as well as a set of rewards and penalties that serve to emphasize rational behavior and "getting the job done." Argyris criticizes this notion by stating that while such values may be consonant with minimal standards of productivity and performance, encouraging higher levels of interpersonal competence increases productivity and promotes a healthier organizational environment. Therefore, communication competence relates to effectiveness in two senses: it encourages high production values, and it fosters a greater personal commitment in the organization (McGregor, 1960).

3. Agreement and Accuracy

Agreement refers to the degree to which two individuals (often, a supervisor-subordinate dyad) have the same perception of some social object in their environment. Accuracy reflects whether one or the other can predict the position or view held by the other member of the pair (Farace, Monge and Russell, 1977).

When an organization is characterizied by high levels of agreement and accuracy, it exhibits consensus. Newcomb (1953) developed a theory of coorientation which predicts different behavioral outcomes for different combinations of agreement and accuracy. He argued that imbalances in accuracy and/or agreement can cause communication to occur. For instance, when two individuals are inaccurate about their perception of each other, their relationship is imbalanced and, in most cases, they will communicate to restore accuracy to the situation. Highly unbalanced relationships cause organizational conflict; high levels of conflict can be extremely dysfunctional to the organization.

The concepts of accuracy and agreement can be applied to any objects of importance in an organizational setting. In the context of communication effectiveness, however, the concepts are most commonly applied to the communication rules and other specific communication behaviors that take place in the organization. Thus, while the logic is the same as for other types of coorientation objects, the application for communication effectiveness is much more specific.

4. Homogeneity or Similarity

Individuals in organizations vary in the amount to which they are like one another along a variety of dimensions; furthermore, perceptual differences come into play in the decision process that individuals undergo in estimating the degree of similarity between themselves and others. Alpert and Anderson (1973) suggest that communication effectiveness is related to the level of influence a source exercises over the actions of message recipients. That is, communication is effective when it causes a receiver to change his or her behavior in some desired way. They state (p. 328), "Communication, and hence the potential for influence, occurs most frequently among individuals who are similar, alike, that is, homophilous."

For an organization, some level of homophily is crucially important with respect to goals, perception of mission, and productivity. When an organization encourages similarity through its message policies, it can take advantage of: (1) higher levels of interpersonal attraction and frequency of interaction (Guetzkow, 1965; Rokeach, 1968); (2) higher potential for communication effectiveness (Lazarsfeld and Merton, 1964): (3) higher perceived communication instrumentality, i.e., communication will be perceived

as more valuable (Rogers and Shoemaker, 1971); and (4) greater employee satisfaction through more effective interpersonal relationships (Alpert and Anderson, 1973).

Alpert and Anderson caution that too much similarity can be dysfunctional, however. Following from the research of Simon (1969), Alpert and Anderson note that certain dissimilarities augment the persuasive effect of communication. Therefore, they introduce the concept of "optimal total heterophily," or "optimal dissimilarity." Thus the effective organization is one which both encourages similarity yet tolerates certain levels of dissimilarity. Communication "stasis" is the equilibrium point which results from the balance of these two forces. This is a conceptualization familiar to conflict theorists, who argue that in the absence of dissensus, an organization will tend to be non-creative, unresponsive to environmental changes and relatively inflexible (Huse, 1975).

5. Uncertainty

Uncertainty has already been discussed as a structural and a message criterion. It is also important to note the important effects of perceived uncertainty on communicating individuals. Huber, O'Connell and Cummings (1975) point out that administrative and management behavior is largely predicted upon the perception of environmental uncertainty. For the individual, environmental uncertainty is of two types--internal and external. Internal uncertainty refers to uncertainties associated with "status quo" operations of an organization. This would include uncertainties about information load, employee behavior, the security of one's position, and about the organization itself.

External uncertainty refers to an individual's perceptions of the relative rate of change in the environment and the quality of information being received about the environment. Huseman, et al., (1977) suggests that message ambiguity, or the amount of uncertainty in a specific communication, promotes message distortion and increases the level of organizational conflict. Weick (1969) states that absolute certainty is never required; instead, individuals "enact" task roles in order to reduce apparent uncertainty (or, in his terms, "equivocality"). In fact, Weick states that it is uncertainty which provides the motivation for the members of an organization to engage in organizing behaviors.

Lawrence and Lorsch (1969) identify four measurable features of organizations which vary with uncertainty levels. These are: (1) the degree of reliance on formalized rules and formal communication channels, (2) the time horizons of managers and professionals, (3) the orientation of managers and professionals towards goals, either diffuse or concentrated, and (4) the interpersonal style of managers and professionals, either relational or task oriented. They found that high-performing companies had a close degree of fit between the attributes of organizational sub-units and the demands and perturbations of the environment to which the sub-units responded. They noted that where a high degree of environmental uncertainty existed, high-performing companies engaged in a large amount of information flow across the organization's boundaries.

Along a similar line, Duncan (1972) conceptualized uncertainty as (1) a lack of information about relevant factors that impact on decisions; (2) a lack of knowledge about organizational decisions; and (3) a lack of ability to

assign probabilities to the distribution of environmental impacts on the success of an organization. A strong correlation was found between general uncertainty in an organization and its use of more efficient means of information transfer. Holland and Stead (1976) argue that employees who spend a great deal of time working with highly uncertain problems should probably be geographically isolated. However, isolation decreases access to and among employees; this in turn increases information transfer costs and penalizes those personnel who are likely to be the most creative and innovative. They further argue that environments which discourage informal contact and stress formality induce organizational members to experience far higher levels of uncertainty than would otherwise be the case.

A final point to be made deals with communicator's intentional manipulation of levels of uncertainty. Carzo and Yanouzas (1967, p. 199) state: "one of the reasons why people are able to gain power that is greater than the administrative authority allocated to their position is that they are strategically located in the flows of information and/or the relationships between or among organizational components." Such individuals gain power through the discretionary release or withdrawal of important information. In effect, they manipulate the uncertainties of those with whom they interact. We have noted that individuals tend to be liaisons and bridges, and their influence is often discussed in organizational literature (Schwartz and Jacobson, 1977); however, the effect of that influence on either overall organizational performance or communication effectiveness is unknown.

Uncertainty is related to organizational communication effectiveness in two ways. First, high levels of perceived uncertainty increase the flow of information from the environment (Lawrence and Lorsch, 1967), and hence,

increase the demand upon the communication system. If adjustments are not made during periods of organizational stress, overall communication effectiveness will be inhibited. Second, uncertainty should be considered in terms of optimal levels that exist within the acceptable boundaries established by organizational members or units. Danowski (1975) states that people have "preferred" levels or tolerances for uncertainty. They seek to maximize this uncertainty, and willfully induce error when their uncertainty drops below a preferred level to some significant degree. The organization that seeks to routinize all uncertainty, and hence, to minimize its impact, should find new and imaginative sources of error occuring as a result.

D. Potpourri

We use the term potpourri as a label for those criteria which either cut across all other categories above, or which do not fit into one of the other criterion dimensions. The criteria to be considered in this section are: cost of information and efficiency.

1. Cost of information

Interestingly, most communication scholars have paid relatively little attention to the cost of communication or information, except in the context of costs involved in technology/hardware. However, it is commonly recognized that all communication events in an organization consume a certain amount of time and resources, and hence should be attributed a certain level of cost. Golightly (1973) found that by accounting for information expense in a multiple regression model of productivity, he was able to markedly improve the ability of the Pareto economic model of the firm to account for variability in the productivity of a firm. In effect, then, he was able to give some

empirical support for the contention that all communication in an organization has cost--and furthermore, that efficiencies in information processing costs are an important component of overall productivity.

In the case of bureaucracies, a large percentage of all activities taking place is in the form of communication events. This suggests that efficiencies in the conduct of these events bear a strong relationship to the organization's ability to transform the resources it acquires into the outcomes it desires. While little research has been done on cost per se, some literature does incorporate it. Glanzer (1973) argues that success in knowledge transfer in achieving institutional change is a function of the organization's willingness to expend resources. Unfortunately, Huber, O'Connell and Cummins (1973) indicate that while economic constraints increase uncertainty and hence the demand for information, information-processing technology is usually the first area to suffer resource cutbacks.

2. Efficiency

Efficiency simply refers to the relative rate of return on energy (time and resources) invested in communicating. In the sense of Simon (1947), returns on investment take the form of any number of inducements or perquisites. It can range from a "pat on the back," a responsive behavior, or monetary compensation. In general, communication is efficient when the returns achieved exceed the amount of energy invested in the communication event.

A more useful concept is perhaps that of relative efficiency, in which alternative communication media and/or strategies are employed to achieve the same end results. By careful accounting of the investments required to bring about desired goals through each communication means, measures of

relative efficiency can be obtained. Relatively little research has been performed that examines large-scale communication systems (particularly those composed chiefly of human components) and that denies and operationalizes their relative efficiency.

Concluding Remarks

This paper provides a description of 21 potential criteria for assessing the effectiveness of organizational communication processes. For each criterion, a computer-based literature search was used to supplement materials available to the authors. Important works related to each criterion are summarized, and the discussion centers on the conditions under which the criterion might be taken to reflect a component of the macro-concept of "organizational communication effectiveness."

The paper clearly represents only the first step in the process of more fully coming to grips with the concept. Criteria involving organizational media are in the process of being outlined in the same fashion that the structure, message, communicator and potpourri criteria categories are treated in the present paper. The next step in the process is the development of testable propositions, and the identification of measurement procedures and research contexts that will enable the propositions to be evaluated. As this work is completed by organizational communication scholars, it will then become considerably easier to respond competently to the quert: "What do you mean by effective communication in organizations?"

References

Adams, J. R., & Swanson, L. A. Information-Processing Behavior and Estimating Accuracy in Operations Management. Academy of Management Journal, 1972, 19(1), 98-110.

*Adelberg, A. H. Management Information Systems and Their Implications. Management Accounting, 1975, 53(9), 328-330.

Aislabie, C. Economic Efficiency of Information Producing Activities. Economic Record, 1972, 48(124), 575-583.

Allen, R.K. Organizational Management Through Communication. New York: Harper and Row Publishers, 1971.

*Allen, T. J., & Cohen, S. I. Information Flow in Research and Development Laboratories. Administrative Science Quarterly, 1969, 14(1), 12-20.

*Alpert, M. I., & Anderson, W. T. Optimal Heterophily and Communication Effectiveness-Some Empirical Findings. Journal of Communication, 1973, 23(3), 328-343.

Alter, S. L. How Effective Managers Use Information-Systems. Harvard Business Review, 1976, 54(6), 97-104.

*Argyris, C. Interpersonal Competence and Organizational Effectiveness. Homewood, Illinois: Erwin-Dorsey, 1962.

Artandi, S. Information Concepts and Their Utility. Journal of the American Society for Information Science, 1973, 24(4), 242-245.

Atkin, C. K. Anticipated Communication and Mass Media Information-Seeking. Public Opinion Quarterly, 1972, 36(2), 188-199.

Baker, N. Structuring Information Flow to Enhance Innovation. Management Science, 1972, 19(1), 105-114.

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*References cited in paper. Other references provide additional information.

*Barnard, C. I. The Functions of the Executive. Cambridge, Mass.: Harvard University Press, 1938.

*Barnett, G., Serota, K., & Taylor, J. Campaign Communication and Attitude Change: A Multidimensional Analysis. Human Communication Research, 1976, 2, 227-244.

Bear, G., & Hodun, A. Implicational Principles and the Cognition of Confirmatory, Incomplete and Irrelevant Information. Journal of Personality and Social Psychology, 1975, 32(4), 594-604.

Beckhard, R. Organization Development: Strategies and Models. Reading, Mass.: Addison-Wesley Publishing Company, 1969.

*Bennis, W. G. Organization Development: Its Nature, Origins, and Prospects. Reading, Mass.: Addison-Wesley Publishing Company, 1969.

*Bentley, T. J. Designing an Information System that Meets the Needs of Management. Management Accounting, 1974, 52(10), 299-303.

Berko, R. M., Wolvin, A. D., & Wolvin, D. R. Communicating: A Social and Career Focus. Boston: Houghton Mifflin Company, 1977.

*Berlo, D. K., Lemert, J. B., & Mertz, R. J. Dimensions for Evaluating the Acceptability of Message Sources. Public Opinion Quarterly, 1970, 33(4), 563-576.

*Bettinghaus, E. P. Persuasive Communication (2nd ed.). New York: Holt, Rinehart and Winston, Inc., 1973.

Bettman, J. R. A Graph Theory Approach to Comparing Consumers Information Processing Models. Management Science, 1971, 18(4), Part II, 114.

Blanchar, K. H., & Hersey, P. Importance of Communication Patterns in Implementing Change Strategies. Journal of Research and Development in Education, 1973, 6(4), 66-75.

Blau, P. M., Falbe, C. M., McKinley, W., & Phelps, T. K. Technology and Organization in Manufacturing. Administrative Science Quarterly, 1976, 21(1), 20-40.

Bradac, J. J. Communicative Competence: Implications for the Field of Speech Communication. Paper presented at the annual meeting of the Speech Communication Association, Chicago, 1972.

Briggin, T. Risk Managers - You Need to Improve Your Communication Skills. Business Insurance, 1977, 11(2), 13.

Bujkovsky, G. J. Information Management. Information and Records Management, 1974, 8(4), 16-44.

*Burch, J. G., & Strater, F. R. Tailoring the Information System. Journal of Systems Management, 1973, 24(2), 34-38.

*Carzo, R., & Yanouzas, J. Effects of Flat and Tall Organizational Structure. Administrative Science Quarterly, 1969, 14, 178-191.

*Chakrabarti, A. K. A Dissonance Theory Approach to Communication Channel Usage. Indian Journal of Social Research, 1972, 13(2), 98-110.

*Clarey, R. J. Technology and Patterns of Communication. Cornell University Sociological Relations, 1966, 1(2), 97-110.

Confidential Information - We Must Have It and We Must Protect It. Insurance Magazine, 1975, 76(6), 26-27.

Croft, J. C. Organizational Development for Thornlea: A Communication Package and Some Results. Paper presented at the annual meeting of the Canadian Educational Research Association (University of Victoria, British Columbia, January 28, 1969).

*Cushman, D. P., & Whiting, G. C. An Approach to COmmunication Theory: Toward Consensus on Rules. Journal of Communication, 1972, 22(3), 217-238.

*Danowski, J. A. An Uncertainty Model: Friendship Communication Networks and Media Related Behavior. Unpublished paper Department of Communication, Michigan State University, 1974.

*Danowski, J. A. An Information Theory of Communication Function: A Focus on Information Aging. Doctoral dissertation, Department of Communication, Michigan State University, 1975.

*David, C. J., & Pruett, J. M. Information Systems - Information Life Span Considerations. Information and Records Management, 1975, 9(5), 24, 27-28.

Deardon, J. F., McFarlin, W., & Zani, W. M. Managing Computer-Based Information Systems. Homewood, Illinois: Richard D. Irwin, Inc., 1971.

Dewhirst, H. D. Influence of Perceived Information - Sharing Norms on Communication Channel Utilization. Academy of Management Journal, 1971, 14(3), 305.

Di Salvo, V., Monroe, C., & Morse, B. Business and Professional Communication. Columbus: Charles E. Merrill Publishing Company, 1977.

Doester, J. A., & Strickland, B. R. Disclosing of Verbal Material as a Function of Information Requested, Information About the Interviewer, and Interviewee. Journal of Consulting and Clinical Psychology, 1971, 37.

*Downs, A. Inside Bureaucracy. Boston: Little Brown Company, 1967.

*Downs, C., Linkugel, W., & Berg, D. M. The Organizational Communicator. New York: Harper and Row Publishers, 1967.

Dronberger, G. S., & Kowitz, G. T. Abstract Readability as a Factor in Information About the Communicator. Journal of American Society for Information Science, 1975, 26(2), 108-111.

*Drucker, P. F. Management: Tasks, Responsibilities. Practices. New York: Harper and Row Publishing Company, 1974.

*Duncan, D. O., Featherman, D. L., & Duncan, B. Socio-Economic Background and Achievement. New York: Seminar Press, 1972.

Eiser, J. R., & Bhavnani, R. Communication Accuracy as a Function of Information About the Communicator. European Journal of Social Psychology, 1973, 3(1), 73-81.

*Emery, F. E., & Trist, E. E. The Causal Texture of Organizational Environments. Human Relations, 1965, 18, 165.

*Ensign, R. B. Measuring the Flow of Management Information. Journal of Systems Management, 1974, 25(2), 40-43.

*Etzioni, A. Modern Organizations. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966.

Evans, J. A. A Framework for the Evolutionary Development of an Executive Information System. Part 2: System Design, Implementation, and Evolution. (Report number: M68-11, publication date: June, 1970, 64).

*Farace, R. V., & Danowski, J. A. Analyzing Human Communication Networks in Organizations: Applications to Management Problems. Unpublished paper, Department of Communication, Michigan State University, 1973.

Farace, R. V., Monge, P. R., & Russell, H. M. Communicating and Organizing. Reading, Mass.: Addison-Wesley Publishing Company, 1977.

Faulkner, R. R. Orchestra Interaction: Some Features of Communication and Authority in an Artistic Organization. Sociological Quarterly, 1973, 14(2), 147-157.

Festinger, L., Schacter, S., & Back, K. Social Pressures in Informal Groups: A Study of Human Factors in Housing. New York: Harper and Row Publishing Company, 1950.

*Floyd, H. F., & Zmud, R. M. Daily Information Reporting. Business Horizons, 1976, 19(1), 39-44.

Fox, I. K., & Wible, L. F. Information Generation and Communication to Establish Environmental Quality Objectives (EN). Natural Resources Journal, 1973, 13(1), 134-149.

Frederiksen, C. H. Acquisition of Semantic Information from Discourse - Effects of Repeated Exposures. Journal of Verbal Learning and Verbal Behavior, 1975, 14(2), 158-169.

Freeman, J. H. Environment, Technology, and the Administrative Intensity of Manufacturing Organizations. American Sociological Review, 1973, 38(6), 750-763.

Friedman, A., & Bourne, L. E. Encoding the Levels of Information in Pictures and Words. Journal of Experimental Psychology, 1976, 105(2), 169-190.

Friedman, B. D., & others. Program-Oriented Information--A Management Systems Complex for State Education Agencies. Part I, Analysis and Proposals. Interim report on a collaborative project, Tentative Guides for a State Education Agency Fiscal, Personnel, and Program Information System. Publication date: 1966, Maryland State Department of Education, Baltimore. Note p. 113.

*Galbraith, J. R. Organization Design--Information Processing View. Interfaces, 1974, 4(3), 28-36.

*Gallagher, C. A. Perceptions of Value of a Management Information System. Academy of Management Journal, 1974, 17(1), 46-55.

Garvey, W. D., & Griffith, B. C. Scientific Communication as a Social System. Science, 1967, 157(3792), 1011-1015.

Gifford, M. B., & Gifford, J. D. Do You Provide the Right Information Required by Management? Management Accounting, 1974, 52(8), 221-224.

*Glanzer, E. M. Knowledge Transfer and Institutional Change. Professional Psychology, 1973, 4(4), 434-444.

Goldhaber, G. M. Organizational Communication. Dubuque, Iowa: William C. Brown Company Publishers, 1974.

Goldhar, J. D., Agaw, L. K., & others. Information Flows, Management Styles, and Technological Innovation. Transactions on Engineering Management, 1976, 23(1), 51-62.

*Golightly, H. O. The What, What Not, and How of Internal Communication. Business Horizons, 1973, 16(6), 47-50.

Grass, R.C., & others. A Behavioral Pretest of Print Advertising. Journal of Advanced Research, 1971, 1(5), 11-14.

*Gross, B. M., & Springer, M. New Goals for Social Information. Annals of the American Academy of Political and Social Science, 1967, 373, 208-218.

*Guetzkow, H. Communication in Organizations. In James G. March (ed.), Handbook of Organizations, Chicago: Rand-McNally, 1965.

Hage, J. Communication and Organizational Control: Cybernetics in Health and Welfare Settings. New York: John Wiley and Sons, 1974.

Haire, M. Psychology in Management. New York: McGraw-Hill Book Company, 1964.

Hampton, D. R., Sumner, C. E., & Webber, R. A. Organizational Behavior and the Practice of Management. Glenview, Illinois: Scott, Foresman and Company, 1973.

Harary, F., & Schwenk, A. J. Efficiency of Dissemination of Information in One-way and Two-way Communication Networks. Behavioral Science, 1974, 19(2), 133-135.

Hasegawa, Y. International Transfer of Marketing/Management Skills Systems and Technology. European Research, 1976, 4(5), 193-200.

Haskins, J. B. Pretesting Interest in Message. Journal of Advertising Research, 1975, (15(5), 31-35.

Hayes, D. P., Meltzer, L., & Lundberg, S. Information Distribution, Interdependence, and Activity Levels. Sociometry, 1968, 31(2), 162-179.

Heydebrand, W. V. Comparative Organizations. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.

Hillis, J. W., & Crano, W. D. Additive Effects of Utility and Attitudinal Supportiveness in Selection of Information. Journal of Social Psychology, 1973, 89, 257-269.

*Holland, W. E., & Stead, B. A. Information Channel/Source Selection as a Correlate of Technical Uncertainty in a Research and Development Organization. IEEE Transactions on Engineering Management, 1976, 23(4), 163-167.

Horton, W. W., Jr. Budgeting the Data and Information Resource. Journal of Systems Management, 1977, 28(2), 12-14.

Housman, E. M. Selective Dissemination of Information. Annual Review of Information Science and Technology, 1973, 8, 221-241.

*Huber, G. P., O'Connell, M. J., & Cummings, L. L. Perceived Environmental Uncertainty - Effects of Information and Structure. Academy of Management Journal, 1975, 18(4), 725-740.

*Huse, E. Organizational Development. New York: John Wiley and Sons, 1975.

*Huseman, R. C., Logue, C. M., & Freshly, D. L. Readings in Interpersonal and Organization Communication (3rd ed.). Boston: Holbrook Press, Inc., 1977.

*Jacobson, E., & Seashore, S. Communication Practices in Complex Organizations. Journal of Social Issues, 1951, 7, 28-40.

*Johnson, B. M. Communication: The Process of Organizing. Boston: Allyn and Bacon, 1977.

Johnson, J. H. Information Flow for Military Construction. Construction Engineering Research Laboratory, Champaign, Illinois: October, 1976.

Judge, A. J. N. Information Systems and Inter-Organizational Space. Annals of the American Academy of Political and Social Science, 1971, 47-64.

*Katzman, N. Impact of Communication Technology--Some Theoretical Premises and Their Implications. Ekistics, 1974, 38(225), 125-130.

Keegan, W. J. Multinational Scaling: A Study of the Information Sources Utilized by Headquarters Executives In Multinational Companies. Administrative Science Quarterly, 1974, 19(3), 411-421.

Khandwalla, P. N. Mass Output Orientation of Operations Technology and Organizational Structure. Administrative Science Quarterly, 1974, 19(1), 74-97.

Kintsch, W., Kozminsky, E., Streby, W. J., McKoon, G., & Keenan, J. M. Comprehension and Recall of Text as a Function of Content Variables. Journal of Verbal Learning and Verbal Behavior, 1975, 14(2), 196-214.

*Kneitel, A. M. Management-Information-Systems-EDP Management-Where the Action Is. Infosystems, 1975, 22(12), 61-62.

Koehler, J. W., Anatol, K. W., & Applebaum, R. L. Organizational Communication: Behavioral Perspectives. New York: Holt, Rinehart and Winston, 1976.

*Korzenny, F. A Theory of Electronic Propinquity: Mediated Communication in Organizations. Communication Research, 1978, 5(1), 3-24.

Lambrecht, W. H., & Teich, A. H. Technology - Tranfers as a Problem in Inter-Organizational Relationships. Administration and Society, 1976, 8(1), 29-54.

Lawler, III, E. E., & Rhode, J. G. Information and Control in Organizations. Pacific Palisades, California: Goodyear Publishing Company, Inc., 1976.

*Lawrence, P. R., & Lorsch, J. W. Developing Organizations: Diagnosis and Action. Reading, Mass.: Addison-Wesley Publishing Company, 1967.

*Lazarsfeld, P. F., & Merton, R. K. Friendship as Social Process: A Substantive and Methodological Analysis. In M. Berger and others (eds.), Freedom and Control in Modern Society, New York: Octagon, 1964.

Levy, R. M. , & Norton, G. K. Effects of Stimulus Dimensionality on Rate of Gain of Information. Quarterly Journal of Experimental Psychology, 1972, 24, 299.

Lewis, P. V. Organizational Communications: The Essence of Effective Management. Columbus, Ohio: Grid, Inc., 1975.

Lin, N., & Burt, R. S. Differential Effects of Information Channels in Processes of Innovation Diffusion. Social Forces, 1975, 54(1), 256-274.

London, M. Effects of Information Heterogeneity and Representational Roles on Group Member Behavior and Perceptions. Journal of Applied Psychology, 1977, 62(1), 76-80.

Louis, K. S. Dissemination of Information from Centralized Bureaucracies to Local Schools - Role of Linking Agent. Human Relations, 1977, 30(1), 25-42.

*Lucas, H. C., Jr. Performance and the Use of an Information System. Management Science, 1975, 21(8), 908-919.

Lumsdon, C. A. Communication Within Organization--Organizational Development, Team Making and Informal Meetings. ASLIB Proceedings, 1975, 27(8), 327-338.

MaCaulay, J. B. Analyzing Formal Sources in a Complex Information Utility. Proceedings of the American Society for Information Science, 1973, 10, 131-132.

Mailey, T. F. Organization of Information - Key to Successful Communication. Proceedings of the American Society for Information Science, 1973, 10, 131-132.

*March, J. G., & Simon, H. Organizations. New York: John Wiley and Sons, 1958.

Marrett, C. B., Ge, J., et al. Communication and Satisfaction in Organizations. Human Relations, 1975, 28(7), 611-626.

McClure, R. D., & Erson, T. E. Print vs. Network News. Journal of Communication, 1976, 26(2), 23-28.

McDonald, D. Communication Roles and Communication Content in a Bureaucratic Setting. A paper presented at the annual meeting of the International Communication Association, Phoenix, Arizona, April, 1971.

*McGregor, D. The Human Side of Enterprise. New York: McGraw-Hill Publishers, 1960.

*McPhee, W. Studies in Theories of Large Groups. Final report submitted to Department of Health, Education and Welfare, 1972. (ERIC)

McRae, T. W. A Citational Analysis of the Accounting Information Network. Journal of Accounting Research, 1974, 12(1), 80-92.

Merrill, M. D. Content and Instructional Analysis for Cognitive Transfer Tasks. Working paper No. 40, Brigham Young University Press, December, 1972.

*Miller, G. E., Galanter, E., & Pribram, K. Plans and the Structure of Behavior. New York: Holt, Rinehart and Winston, 1960.

*Miller, G. R., & Burgoon, M. New Techniques of Persuasion. New York: Harper and Row Publishers, 1973.

Miller, G. R., & Steinberg, M. Between People: A New Analysis of Interpersonal Communication. Chicago: Science Research Associates, 1975.

*Miller, J. G. Psychological Aspects of Communication Overloads. In R. W. Waggoner and D. J. Clark (eds.), International Psychiatry Clinics: Communication in a Clinical Practice, Boston: Little Brown Company, 1964.

*Miller, L. R. Law and Information Systems. Journal of Systems Management, 1977, 28(1), 21-29.

Milwaukee,Public Schools, Wisconsin. Procedures for Program Evaluation. (Planning Document Number 4, October, 1972).

*Mitchell, J. C. (ed.). Social Networks and Urban Situations. Manchester, England: Manchester University Press, 1969.

Moisse, E. Costing Information in an Independent Organization. Information Scientist, 1976, 10(2), 57-68.

*Monge, P. R., & Lindsey, G. Communication Patterns in Large Organizations. Unpublished manuscript, Department of Speech Communication, San Jose State University, 1973.

Morissey, E., & Gillespie, D. F. Technology and the Conflict of Professionals in Bureaucratic Organizations. Sociological Quarterly, 1975, 16(3), 319-332.

*Muller, J. Sources of Measured Technical Efficiency--Impact of Information. American Journal of Agricultural Economics, 1974, 56(4), 730-738.

*Murdick, R. G., & Ross, J. E. Future Management - Information-Systems. Journal of Systems Management, 1972, 23(5), 32-35.

*Newcomb, T. M. An Approach to the Study of Communicative Acts. Sociological Review, 1953, 60, 393-404.

Nydegger, R. V. Information-Processing Complexity and Leadership Status. Journal of Experimental Social Psychology, 1975, 11(4), 317-328.

*Nystedt, L., & Magnusson, D. Predictive Efficiency as a Function of Amount of Information. Multivariate Behavioral Research, 1972, 7(4), 441-450.

Obitz, F. W., & Oziel, L. J. Varied Information Levels and Accuracy of Person Perception. Psychological Reports, 1972, 31(2), 571.

O"Connell, M. J., Cummings, L. L., & Huber, G. P. Effects of Environmental Information and Decision Unit Structure on Felt Tension. Journal of Applied Psychology, 1976, 61(4), 493-500.

Olson, E. E. Organizational-Factors Affecting Information-Flow in Industry. ASLIB Proceedings, 1977, 29(1), 2-11.

*Oniki, H. Cost of Communication in Economic Organization. Quarterly Journal of Economics, 1974, 88(4), 529-550.

*O'Reilly, C. A. I., & Roberts, K. H. Information Filtration in Organizations-Three Experiments. Organization Behavior and Human Performance, 1974, 11(2), 253-265.

Otten, K. W., Publishing and Information Distribution with Microfilm. The Journal of Micrographics, 1976, 9(3), 127-131.

Owen, J. L., Page, P. A., & Zimmerman, G. I. Communication in Organizations. St. Paul: West Publishing Company, 1976.

Park, C. W., & Shelth, J. N. Impact of Prior Familiarity and Cognitive Complexity on Information-Processing Rules. Communication Research, 1975, 2(3), 260-266.

Parker, E. B. Implications of New Information Technology. Public Opinion Quarterly, 1973/74, 37(4), 590-600.

Parker, E. B., & Shelth, J. N. Information Technology: Its Social Potential. Science, 1972, 176(4042), 1392-1399.

Paur, T. R. Formslides - Information for the User. Journal of Micrographics, 1976, 9(4), 161-163.

*Pines, H. A., & Julian, J. W. Effects of Task and Social Demands on Locus of Control Differences in Information Processing. Journal of Personality, 1972, 40(3), 407.

*Planty, E., & Machaver, W. Upward Communication: A Project in Executive Development Using the Syndicate Method. Personnel, 1952, 28, 66-70.

Porat, A. M., & Haas, J. A. Information Effects on Decision-Making. Behavioral Science, 1969, 14(2), 98-104.

*Porter, L., & Lawler, E. Properties of Organizational Structure in Relation to Job Attitudes and Job Behaviors. Psychological Bulletin, 1965, 64, 23-51.

Prywes, N. S., & Smith, D. P. Organization of Information. Annual Review of Information Science and Technology, 1972, 7, 103-158.

Quinn, R. E. The Impacts of a Computerized Information System on the Integration and Coordination of Human Services. Public Administration Review, 1976, 36(2), 166-174.

*Richards, W. D. Network Analysis in Large Complex Systems: Metrics. Unpublished paper, Institute for Communication Research, Stanford University, 1974.

Robertson, A. Effect on an Organization of Communication with Outside--Relationship Between Free Flow of Information and an Organization's Effectiveness. ASLIB Proceedings, 1975, 27(8), 339-345.

Robertson, A. Information Flow and Industrial Innovation. ASLIB Proceedings, 1973, 25(4), 130-139.

*Roekeach, M. Beliefs, Attitudes and Values. San Francisco: Jossey-Bass, 1968.

*Rogers, E., & Shoemaker, F. Communication of Innovations: A Cross-Cultural Approach. New York: The Free Press, 1971.

Rogers, E. M., & Rogers, R. A. Communication in Organizations. New York: The Free Press, 1976.

Rosenblott, S. B., Cheatham, T. R., Watt, J. T. Communication in Business. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1977.

Rosie, A. M. Information and Communication Theory. London: Blackie and Son Limited, 1966.

Ross, A. S., & Wilson, P. Effects of Utility of Information and Intent on Interpersonal Esteem. Journal of Social Psychology, 1972, 87(1), 83.

*Rothwell, R. Patterns of Information-Flow During Innovation Process. ASLIB Proceedings, 1975, 27(5), 217-226.

*Rothwell, R., & Robertson, A. B. Contribution of Poor Communication to Innovative Failure. ASLIB Proceedings, 1975, 27(10), 393-400.

Royer, J. M., & Cable, G. W. Illustrations, Analogies, and Facilitative Transfer in Prose Learning. Journal of Educational Psychology, 1976, 68, 205-209.

Russell, H. M. Communication: Key to Understanding. Journal of Extension, 1972, 10(4), 12-22.

Salcedo, R. W., Read, H., Evans, J. F., & Kong, A. C. A Successful Information Campaign on Pesticides. Journalism Quarterly, 1974, 51(1), 91-95.

*Saltiel, J., & Woelfel, J. Accumulated Information and Attitude Change. Human Communication Research, 1975, 1, 333-344.

Sanford, A. C., Hunt, G. T., & Bracey, H. J. Communication Behavior in Organizations. Columbus, Ohio: Charles E. Merrill Publishing Company, 1976.

Saracevic, T., Rothenberg, D. H., & Stephen, P. Study of Information Utility. Proceedings of the American Society for Information Science, 1974, 11, 234-238.

Schein, E. H. Organizational Psychology (2nd ed.). Engelwood Cliffs, New Jersey: Prentice-Hall, Inc., 1970.

Schein, E. H. Process Consultation: Its Role in Organization Development. Reading, Mass.: Addison-Wesley Publishing Company, 1969.

*Schneider, J. H. Selective Dissemination and Indexing of Scientific Information. Science, 1971, 173(3994), 300-308.

*Schneyman, A. H. Management Information Systems for Management Sciences. Interfaces (Tims), 1976, 6(3), 52-59.

*Schuler, R., & Blank, L. F. Relations Among Types of Communication, Organizational Level, and Employee-Satisfaction and Performance. IEEE Transactions of Engineering Management, 1976, 23(3), 124-129.

*Schwartz, D. F., & Jacobson, E. Organizational Communication Network Analysis-The Liaison Communication Role. Organizational Behavioral and Human Performance, 1977, 18(1), 158-174.

*Shannon, C., & Weaver, W. The Mathematical Theory of Communication. Urbana: University of Illinois Press, 1938.

Sherman, J. L. Contextual Information and Prose Comprehension. Journal of Reading Behavior, 1976, 8(4), 369-379.

Sigband, N. B. Communication for Management. Glenview, Illinois: Scott, Foresman and Company, 1969.

*Simon, H. A. Administrative Behavior: A Study of Decision-Making Processes in Administrative Organizations (2nd ed.). New York: MacMillan Company, 1947.

Simon, H. A. The Sciences of the Artificial. Cambridge, Mass.: MIT Press, 1969.

Singh, K. N., & Jha, P. N. Factors Associated with Communication Fidelity as Perceived by Persons Connected with High-Yielding Varieties Programme. Behavioral Sciences and Community Development, 1971, 5(1), 21-37.

Skelton, B. Scientists and Social Scientists as Information Users--Comparison of Results of Science User Studies with Investigation into Information Requirements of Social Sciences. Journal of Librarianship, 1973, 5(2), 138-156.

Smith, A. W. An Information Model and Evaluation Tool for R & D Projects and Contractor Selections Percept. Industrial Marketing Management, 1973, 2(2), 163-173.

Stamm, K. R., Bower, J. E., & Bowes, B. J. Generation Gap a Communication Problem? A Coorientational Analysis. Journalism Quarterly, 1973, 50(4), 629-637.

Stanfield, G. G. Technology and Organization Structure as Theoretical Categories. Administrative Science Quarterly, 1976, 21(3), 489-493.

Strawhorn, J. M., & Creager, W. A. Innovations to Improve Primary Dissemination of Scientific and Technical-Information. Proceedings for the American Society for Information Science, 1975, 12, 99-100.

Stymne, Pengt. Interdepartmental Communication and Intraorganizational Strain. ACTA Sociologica, 1968, 11(1-2), 82-100.

*Sumners, J. O. Less Information is Better? Journal of Marketing Research, 1974, 11(4), 467-468.

*Taylor, J. A. An Empirical Examination of the Referential Function of Informal Communication Groups. Master's thesis, Department of Communication, Michigan State University, 1976.

*Taylor, J. A. Communication Research and Health Care: A Review and Critique of the Literature. Unpublished paper, Department of Communication, Michigan State University, April, 1977.

Taylor, J. A., & Farace, R. V. The Referential Function of Internal Communication Groups in Complex Organizations: An Empirical Analysis. Unpublished paper, Department of Communication, Michigan State University, 1976.

*Taylor, J. A., Farace, R. V., & Monge, P. R. Communication and the Development of Change Among Educational Practitioners. Unpublished paper, Department of Communication, Michigan State University, 1976.

*Thompson, V. A. Bureaucracy and Innovation. University, Alabama: University of Alabama Press, 1967.

*Turpin, J. B. Communication Needs of MIS. Journal of Systems Management, 1972, 23(12), 28-30.

Vardaman, G. T., & Halterman, C. C. Managerial Control Through Communication: Systems for Organizational Diagnosis and Design. New York: John Wiley and Sons, Inc., 1968.

Vardaman, G. T., & Vardaman, P. B. Communication in Modern Organizations. New York: John Wiley and Sons, Inc., 1973.

*Weick, K. E. The Social Pscyhology of Organizing. Reading, Mass.: Addison-Wesley Publishing Company, 1969.

Whitley, R. D., & Frost, P. A. Authority, Problem Solving Approaches, Communication and Change in a British-Research-Laboratory. Journal of Management Studies, 1972, 9(3), 337-361.

*Whittmore, B. J., & Yovits, M.C. Generalized Conceptual Development for Analysis and Flow of Information. Journal of the American Society for Information Science, 1973, 24(3), 221-231.

*Wigand, R. T. Communication Network Analysis in Urban Development. A paper presented at the annual meeting of the International Communication Association, Chicago, April, 1975.

Woelfel, J., & Hernandez, D. Media and Interpersonal Effects on Attitude Formation and Behavior. Unpublished manuscript, University of Illinois, 1972.

*Wofford, J. C., Gerloff, E. A., & Cummins, R. C. Organizational Communication: The Keystone to Managerial Effectiveness. New York: McGraw-Hill Book Company, 1977.

*Woodward, J. Industrial Organization: Theory and Practice. London: Oxford University Press, 1965.

Wortman, P. M. Long-Term Retention of Information as a Function of Its Organization. Journal of Experimental Psychology-Human Learning and Memory, 1975, 1(5), 576-583.

Yorks, L. Managing Professional Relationships - Part I - Communication Skills. Journal of Systems Management, 1977, 28(1), 6-11.

Yukl, G. A. Effects of Information, Payoff Magnitude, and Favorability of Alternative Settlement on Bargaining Outcomes. Journal of Social Psychology, 1976, 98(2), 269-282.

Zaltman, G., & Kohler, B. M. The Dissemination of Task and Socio-Emotional Information in an International Community of Scientists. Journal of the American Society for Information Science, 1972, 23(4), 225-236.